REMARKS

Summary of Amendments

1. The specification has been amended to correct the designation of a Japanese patent-related publication cited in a paragraph of the background, to correct an editorial error in a paragraph of the description introducing the embodiments, and to make a technical revision to the description of Embodiment 4. It is believed that this last-mentioned revision is permissible as being obvious to a person skilled in the art, and having no bearing whatsoever on the subject matter of the claims.

2. Claims 1-16 were originally presented in this application. Claims 17-20 have been added. No claims have been canceled. Claims 1, 2-4, and 9-12 have been amended, as described in more detail below, to more particularly point out and distinctly claim the subject matter of the instant invention. Claims 1-20 are thus pending.

Claim Rejections – 35 U.S.C. § 112

3. Claims 2-4 and 10-12 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended claims 2-4 and 10-12 as requested by the Examiner on page 2 of the Office Action, and believe that therefore the rejection under this section has been overcome.

Claim Rejections – 35 U.S.C. § 103

4. Claims 1, 2, 5, 6, 9, 10, 13, and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Sato et al.* (Japanese Unexamined Pat. App. Pub. No. 2002-134484, machine translation; simply "*Sato*" hereinafter). In particular, with respect to independent claim 1, on page 3 of the Office action, the Examiner states:

> *Sato* fails to teach that the recess is contoured either so that the perimetric wall meets the bottom surface to form an angle of over 90° and 170°, or less or so that the perimetric wall and bottom face join in a bottom-portion circumferential verge having a curvature of 0.1 mm or more.

> *Sato* teaches, generally, that the device is configured such that the perimetric wall and the bottom surface form an angle and that the bottom portion may have a curvature (see Figs. 3-5). Moreover, *Sato* teaches that the curvature may be varied depending on the diameter of the substrate being processed; showing that the curvature is a result-effective variable (page 6, paragraph [0024] last sentence). Similarly, the angle is result effective and may be determined based upon the substrate being processe[d].
>
> It has been held that "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." . . . Thus, in the present case, since *Sato* teaches that the angle or curvature at which the parametric wall and bottom surface meet is result-effective, it is not considered inventive to discover optimum or workable ranges with respect to this parameter.

5. Applicants respectfully traverse the § 103(a) rejection of independent claim 1 to the extent that it is pertinent to the claim as amended. Claim 1 has been amended to recite:

> a recess formed in said wafer-retaining face with room to carry a semiconductor manufacturing wafer, said recess <u>including a perimetric wall and a substantially planar bottom face</u>, and being shaped such that the perimetric wall meets the bottom face to form an angle <u>greater than</u> 90° and <u>less than</u> 170°.

The amendment to independent claim 1 is supported by original claim 1 (the perimetric wall meeting the bottom face to form an angle greater than than 90° and less than 170°) and by original Fig. 1, which shows a flat, substantially planar bottom face 5a upon which the wafer 6 is deployed. The planarity of bottom face 5a is also shown on Figs. 2 and 3. No new matter has been entered and no new search should be required.

6. Applicants respectfully submit that claim 1 now distinguishes patentably over *Sato*. As amended, claim 1 now recites a recess having "a substantially planar bottom face" and a perimetric wall that meets the bottom face "to form an angle greater than 90° and less than 170°." *Sato* makes no disclosure of a substantially planar bottom face meeting a perimetric wall at an angle of greater than 90° and less than 170°.

7. Moreover, Applicants respectfully submit that *Sato* teaches away from a recess having a substantially planar bottom face upon which a semiconductor substrate is deployed (see original Fig. 2 of the instant application). On the contrary, in his

description of the prior art, *Sato* contrasts his invention with, and points out the disadvantages of, prior art devices having a "flat face" that completely contacts a semiconductor substrate deployed thereon. (See *Sato* paragraph [0005].) According to *Sato*, such configurations do not advantageously enable efficient heat conduction from the susceptor to the substrate. *Sato* goes on to teach that the susceptor should have a concave profile so that only the periphery of the substrate contacts the susceptor (see Figs. 2-4). This is in direct contrast to amended claim 1, which recites a "substantially planar bottom face" upon which a semiconductor substrate is deployed.

8. Continuing the above, *Sato* further teaches that a crevice (gap) is formed between the semiconductor substrate and the susceptor having a predetermined thickness *A* (paragraph [0019] and Figs. 2-4). This distance *A* is preferably in the range from 0.1 to 0.2 mm (paragraph [0024]). This is in direct contrast to the present invention, in which the semiconductor substrate contacts the bottom face ***across the entire diameter of the substrate***. In paragraphs [0024] through [0028] and Figs. 2-4, *Sato* discloses various susceptor profiles (curved, inclined, etc.) that are suitable for achieving the gap *A*. *Sato* makes no mention of the perimetric wall or the angle at which the perimetric wall meets the bottom face. In fact, *Sato* is not concerned with the perimetric wall or its meeting with the bottom face. On the contrary, as described above, *Sato* is concerned only with achieving gap *A* and providing proper peripheral support for the semiconductor substrate.

9. Furthermore, *Sato* shows no recognition of the problem faced by the Applicants. As described in the original specification (e.g., at the top of page 3), an object of the invention therein was to eliminate cracking caused by thermal radiation into the circumferential surface of the substrate. In order to accomplish this object, the substrate recess was shaped as described above to minimize said thermal radiation. Not only does *Sato* show no recognition of the substrate cracking problem, but the solution to the problem taught in the instant invention is in direct contrast to *Sato*, which teaches a structure that promotes peripheral heating of the substrate as described above in Section 6 of this paper.

10. Applicants respectfully submit that claim 1, as amended, is non-obvious in view of *Sato* for the reasons set forth above in Sections 5-8. In summary, *Sato* clearly teaches away from a structure having a "substantially planar bottom face." Moreover, *Sato* includes no suggestion or even any discussion whatsoever of the perimetric wall, not to mention its meeting with the bottom face. Nor does *Sato* even recognize the problem faced by Applicants, namely that of reducing or eliminating the incidence of substrate cracking. Applicants respectfully submit that the § 103(a) rejection of independent claim 1 is therefore overcome.

11. Applicants respectfully submit that dependent claim 9, as amended, is further patentably distinct over *Sato*. The amendment to claim 9 is fully supported by

original claim 9 (as well as by original claim 1), such that no new matter has been entered and no new search should be required.

12. As stated above in Section 7, *Sato* makes no mention of the perimetric wall or the angle at which the perimetric wall meets the bottom face. Nor does *Sato* make any mention of a curvature of the region at which the perimetric wall meets the bottom face. In his rejection, the Examiner asserts, "[T]he curvature is a result-effective variable (page 6, paragraph [0024] last sentence)." Applicants respectfully disagree. In paragraph [0024], *Sato* is referring to the curvature of the bottom face of the recess (inclined plane 24). *Sato* teaches that the curvature of inclined plane 24 may vary so long as the thickness of gap *A* is maintained. This is not the same, nor even closely related, to the curvature referred to in claim 9. Claim 9 is referring to the curvature of the verge 5c (or rim or region) at which the perimetric wall 5b meets the bottom face 5a. (Cf. Fig. 1.) Since *Sato* makes no reference to the curvature of such a verge 5c, it cannot be said that such a curvature is a "result-effective variable." Accordingly, Applicant submits that claim 9 is further patentably distinct over *Sato*, and therefore that the § 103(a) rejection of claim 9 is overcome.

13. Applicants present new claims 17-20 for consideration. Applicants respectfully submit that new claim 17 is fully supported by original claim 1 and new claims 18-20 are supported by corresponding original claims 2-4, such that new matter has been entered and no new search should be required. In particular, new claim 17 recites a ceramic susceptor comprising:

> a recess formed in said wafer-retaining face with room to carry a semiconductor manufacturing wafer, the recess including a perimetric wall and a bottom face, the perimetric wall and the bottom face joining in a circumferential verge having a radius of curvature of a 0.1 mm or more.

14. Applicants respectfully submit that new claim 17 is patentably distinct over *Sato* for the same reasons described in Section 11 above for claim 9. In particular, as described above, *Sato* makes no disclosure or suggestion of a circumferential verge having a radius of curvature greater than 0.1 mm. Applicants submit that claim 17 should therefore be held allowable.

15. Claims 3, 4, 7, 8, 11, 12, 15, and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Sato* in view of *Soma et al.* (U.S. Pat. No. 5,231,690). Applicants respectfully submit that this rejection is moot in view of the remarks set forth above in Sections 5-8 and 11.

16. Applicants therefore submit that independent claims 1 and 17 are patentable over the prior art of record. Independent claims 1 and 17 being allowable, it follows that dependent claims 2-16 and 18-20 must also be allowable.

Accordingly, Applicants courteously urge that this application is in condition for allowance. Reconsideration and withdrawal of the rejections is requested. Favorable action by the Examiner at an early date is solicited.

Respectfully submitted,

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